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STEVE CRISAFULLI
*Speaker of the House of
Representatives*



June 22, 2015

Ms. Carlotta Stauffer, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, Florida 32399-0850

Re: Docket No. 150009-EI

Dear Ms. Stauffer:

Please find enclosed for filing in the above referenced docket the Direct Testimony of **William R. Jacobs, Jr. Ph.D.** This filing is being made via the Florida Public Service Commission's Web Based Electronic Filing portal.

If you have any questions or concerns; please do not hesitate to contact me. Thank you for your assistance in this matter.

Sincerely,

A handwritten signature in blue ink, appearing to read "Patricia A. Christensen".

Patricia A. Christensen
Associate Public Counsel

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing has been
furnished by electronic mail on this 22nd day of June, 2015, to the following:

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Patricia A. Christensen
Associate Public Counsel

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In Re: Nuclear Cost Recovery)
Clause.)

Docket No. 150009-EI
FILED: June 22, 2015

DIRECT TESTIMONY

OF

WILLIAM R. JACOBS, JR., Ph.D.

ON BEHALF OF THE CITIZENS OF

THE STATE OF FLORIDA

REVIEW OF FLORIDA POWER AND LIGHT COMPANY'S

NUCLEAR COST RECOVERY RULE FILING

1 **DIRECT TESTIMONY**

2 **OF**

3 **WILLIAM R. JACOBS, JR., Ph.D.**

4 On Behalf of the Office of Public Counsel

5 Before the

6 Florida Public Service Commission

7 Docket No. 150009-EI

8

9 **Q. PLEASE STATE YOUR NAME, TITLE AND BUSINESS ADDRESS.**

10 A. My name is William R. Jacobs, Jr., Ph.D. I am an Executive Consultant with GDS
11 Associates, Inc. ("GDS"). My business address is 1850 Parkway Place, Suite 800,
12 Marietta, Georgia 30067.

13

14 **Q. DR. JACOBS, PLEASE SUMMARIZE YOUR EDUCATIONAL**
15 **BACKGROUND AND EXPERIENCE.**

16 A. I received a Bachelor of Mechanical Engineering in 1968, a Master of Science in
17 Nuclear Engineering in 1969 and a Ph.D. in Nuclear Engineering in 1971, all from
18 the Georgia Institute of Technology. I am a registered professional engineer and a
19 member of the American Nuclear Society. I have more than 35 years of experience in
20 the electric power industry including more than 12 years of power plant construction
21 and start-up experience. I have participated in the construction and start-up of seven
22 power plants in this country and overseas in management positions including start-up
23 manager and site manager. As a loaned employee at the Institute of Nuclear Power

1 Operations (“INPO”), I participated in the Construction Project Evaluation Program,
2 performed operating plant evaluations, and assisted in the development of the Outage
3 Management Evaluation Program. Since joining GDS in 1986, I have participated in
4 rate case and litigation support activities related to power plant construction,
5 operation, and decommissioning. I have evaluated nuclear power plant outages at
6 numerous nuclear plants throughout the United States. I served on the management
7 committee of Plum Point Unit 1, a 650 MWe coal fired power plant located near
8 Osceola, Arkansas. As a member of the management committee, I assisted in
9 providing oversight of the engineering, procurement, and construction (“EPC”)
10 contractor for this project. I am currently the Georgia Public Service Commission’s
11 (“GPSC”) Independent Construction Monitor for Georgia Power Vogtle Units 3 and 4
12 nuclear project (“Vogtle”). As the Independent Construction Monitor, I assist the
13 GPSC Commissioners and Staff in providing regulatory oversight of the project. My
14 monitoring activities include regular meetings with project management personnel
15 and regular visits to the Vogtle plant site to monitor construction activities and assess
16 the project schedule and budget. My résumé is included as Exhibit WRJ-1.

17
18 **Q. WHAT IS THE NATURE OF YOUR BUSINESS?**

19 A. GDS is an engineering and consulting firm with offices in Marietta, Georgia; Austin,
20 Texas; Manchester, New Hampshire; Madison, Wisconsin; and Auburn, Alabama.
21 GDS provides a variety of services to the electric utility industry, including power
22 supply planning, generation support services, rates and regulatory consulting,
23 financial analysis, load forecasting, and statistical services. Generation support

1 services provided by GDS include fossil and nuclear plant monitoring, plant
2 ownership feasibility studies, plant management audits, production cost modeling,
3 and expert testimony on matters relating to plant management, construction,
4 licensing, and performance issues in technical litigation and regulatory proceedings.

5
6 **Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?**

7 A. I am appearing on behalf of the Florida Office of Public Counsel (“OPC”), who
8 represents the ratepayers of Florida Power & Light Company (“FPL”).

9
10 **Q. WHAT WAS YOUR ASSIGNMENT IN THIS PROCEEDING?**

11 A. I was asked to assist OPC in conducting a review and evaluation of requests by FPL
12 for authority to collect historical and projected costs associated with FPL’s Turkey
13 Point Units 6 and 7 new nuclear project through the capacity cost recovery clause. I
14 was asked to present my findings to assist the Florida Public Service Commission
15 (“FPSC” or “Commission”) in making its determination regarding FPL’s requests.

16
17 **Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION IN
18 THE NUCLEAR COST RECOVERY CLAUSE?**

19 A. Yes. I testified on behalf of OPC in the previous nuclear cost recovery clause
20 (“NCRC”) proceedings in Docket Nos. 080009-EI, 090009-EI, 100009-EI, 110009-
21 EI, 120009-EI and 130009-EI.

1 **Q. PLEASE SUMMARIZE OPC'S PAST PARTICIPATION IN THE**
2 **PROCEEDINGS REGARDING TURKEY POINT UNITS 6 AND 7.**

3 A. I am informed that OPC's earliest involvement was when OPC objected to FPL's
4 request for a declaratory statement concerning the classification of expenses that FPL
5 was to incur prior to the date that site selection expenses were completed. FPL asked
6 the Commission to confirm that such items would be treated as preconstruction
7 expenses, and thus would qualify for recovery through the NCRC. Because FPL's
8 examples included expensive, "long lead" equipment, OPC asked for a hearing to
9 develop the impact of FPL's petition on customers' bills. The Commission denied
10 OPC's request for a hearing and granted FPL's petition.

11 In Docket No. 080009-EI, I criticized FPL's initial policy of contracting for
12 the development of Turkey Point Units 6 and 7 on the basis of separate contracts
13 rather than an overall EPC contract. More recently, it has been my opinion that the
14 minimalist approach that FPL is taking with respect to the development of its
15 proposed new nuclear units is a preferable course of action in light of the downward
16 trend in natural gas prices, uncertainty regarding future load growth, and construction
17 delays being experienced with current nuclear power plant construction projects.
18 OPC has not taken exception to FPL's pursuit of the Combined License ("COL")
19 from the Nuclear Regulatory Commission ("NRC") or the costs related to that effort.

20
21 **Q. ARE YOU AWARE OF ANY CHANGES IN THE STATUTE THAT**
22 **AUTHORIZES COST RECOVERY FOR TURKEY POINT UNITS 6 AND 7?**

1 A. Yes, I am aware that the statute for nuclear cost recovery was amended by the
2 Legislature in 2013. Section 366.93(3)(a)-(e), Florida Statutes, now reads as follows:

3 (3)(a) After a petition for determination of need is granted, a
4 utility may petition the commission for cost recovery as
5 permitted by this section and commission rules.

6 (b) During the time that a utility seeks to obtain a combined
7 license from the Nuclear Regulatory Commission for a nuclear
8 power plant or a certification for an integrated gasification
9 combined cycle power plant, the utility may recover only costs
10 related to, or necessary for, obtaining such licensing or
11 certification.

12 (c) After a utility obtains a license or certification, it must
13 petition the commission for approval before proceeding with
14 preconstruction work beyond those activities necessary to
15 obtain or maintain a license or certificate.

16 1. The only costs that a utility that has obtained a license
17 or certification may recover before obtaining commission
18 approval are those that are previously approved or necessary to
19 maintain the license or certification.

20 2. In order for the commission to approve preconstruction
21 work on a plant, it must determine that:

22 a. The plant remains feasible; and

23 b. The projected costs for the plant are reasonable.

24 (d) After a utility obtains approval to proceed with
25 postlicensure or postcertification preconstruction work, it must
26 petition the commission for approval of any preconstruction
27 materials or equipment purchases that exceed 1 percent of the
28 total projected cost for the project. Such petition shall be
29 reviewed and completed in the annual Nuclear Cost Recovery
30 Clause proceeding in which it is filed or in a separate
31 proceeding by the utility.

32 (e) A utility must petition the commission for approval
33 before beginning the construction phase.

34 1. The only costs that a utility that has obtained
35 commission approval may recover before beginning
36 construction work are those that are previously approved or
37 necessary to maintain the license or certification.

38 2. In order for the commission to approve proceeding with
39 construction on a plant, it must determine that:

- 1 a. The plant remains feasible; and
2 b. The projected costs for the plant are reasonable.
3

4 While I will not opine on the legal implications of these statutory changes, I am aware
5 that it is now relevant to the annual cost recovery review to distinguish which costs
6 are associated with the various phases of the nuclear project, such as obtaining the
7 COL, preconstruction, and construction phases.
8

9 **Q. WHAT ISSUES WILL YOU ADDRESS IN YOUR TESTIMONY?**

10 A. I will address a fundamental flaw in FPL's feasibility analysis. I will also address
11 FPL's request for recovery of preconstruction costs that are not related to, or
12 necessary for, obtaining the COL for Turkey Point Units 6 and 7.
13

14 **Q. WHAT ARE THE PRIMARY COST DRIVERS IN THE FEASIBILITY
15 ANALYSIS PREPARED BY FPL?**

16 A. The primary cost drivers in FPL's feasibility analyses are capital costs of the
17 generation options, projected fuel costs, and projected environmental impact costs.
18 These three components of the feasibility analysis must accurately reflect the
19 proposed project costs for the analysis to provide meaningful results.
20

21 **Q. IN YOUR OPINION, IS FPL'S FEASIBILITY ANALYSIS FLAWED?**

22 A. Yes, I believe that FPL's feasibility analysis as presented in this year's cost recovery
23 docket is flawed.

1 **Q. PLEASE EXPLAIN WHY YOU CONSIDER FPL'S FEASIBILITY ANALYSIS**
2 **FOR TURKEY POINT UNITS 6 AND 7 TO BE FLAWED.**

3 A. I believe that FPL's feasibility analysis for Turkey Point Units 6 and 7 is flawed
4 because the analysis utilizes unreasonably low costs for Turkey Point Units 6 and 7.

5

6 **Q. PLEASE EXPLAIN WHY YOU BELIEVE THE COST ESTIMATES FOR**
7 **TURKEY POINT UNITS 6 AND 7 USED IN FPL'S FEASIBILITY ANALYSIS**
8 **ARE SIGNIFICANTLY UNDERSTATED.**

9 A. The cost estimates used by FPL are based on the current, publicly reported costs for
10 the Vogtle Units 3 and 4 project and the V.C. Summer 2 and 3 ("Summer") project.
11 As explained in more detail later in my testimony, the costs reported by the Vogtle
12 and Summer owners do not include the costs being incurred by the contractor over
13 and above the contract cost. The costs actually being incurred by the contractor are
14 significant and will be fully reflected in the cost for the next AP1000 plant.

15

16 **Q. WHY ARE THE PUBLICLY REPORTED COST ESTIMATES FOR VOGTLE**
17 **AND SUMMER NOT REPRESENTATIVE OF TURKEY POINT UNITS 6**
18 **AND 7 COSTS WHEN ESCALATED TO THE APPROPRIATE TIME**
19 **PERIOD?**

20 A. The publicly reported costs for Vogtle and Summer do not fully represent the actual
21 costs being incurred on the Vogtle and Summer projects. Vogtle and Summer are
22 being constructed using fixed/firm price engineering, procurement, and construction
23 (EPC) contracts. This type of contract protects the owner from most of the risk of

1 capital cost increases due to increased labor resulting from lower productivity than
2 estimated, the impact of engineering design changes, the impact of material cost
3 increases, and the impact of schedule delays. The costs being publicly reported by
4 Vogtle and Summer are only the owner's costs under their EPC agreements. They do
5 not include the actual costs being incurred (and absorbed to date) by Westinghouse
6 and Chicago Bridge and Iron ("CB&I"), the contractor for these projects. In my
7 opinion, the costs being incurred by the Vogtle and Summer contractor are
8 substantially higher than those covered by the Vogtle and Summer EPC agreements
9 and these additional contractor costs must be included in a reasonable estimate of the
10 costs of Turkey Point Units 6 and 7.

11
12 **Q. WHAT EVIDENCE DO YOU HAVE THAT THE VOGTLE AND SUMMER**
13 **CONTRACTOR IS INCURRING SIGNIFICANTLY HIGHER COSTS THAN**
14 **ARE BEING SHOWN BY THE PROJECT OWNERS?**

15 A. The contractor for the Vogtle and Summer projects is definitely incurring significant
16 costs beyond the firm price in the EPC contracts. The precise amount of these
17 additional costs is not publicly available; however, the magnitude of these costs can
18 be inferred. Much of the additional costs are schedule driven. The projects were bid
19 based on a 54-month schedule with commercial operation for Vogtle Unit 3 to occur
20 in April 2016. The current schedule for Vogtle Unit 3 is now 39 months later with a
21 Commercial Operation Date ("COD") to occur in June 2019. This is a 72% increase
22 in construction schedule duration. These additional costs for construction labor,

1 project management, and technical support during this delay are being absorbed by
2 the contractor and are not being included in the costs “publicly reported” for Vogtle.

3
4 It is also very difficult to quantify these additional costs that are being incurred by the
5 contractor. By way of example, Southern Nuclear (the project manager for the
6 Vogtle owners) has approximately 400 employees stationed at the Vogtle site.
7 Southern Nuclear estimates that its cost of labor during the schedule delays is
8 approximately \$6 million per month. Applying the current 39-month delay in the
9 schedule results in an approximate \$234 million increase in labor costs for the Vogtle
10 owners. However, the contractor has over 5,000 workers at the Vogtle site. Thus, the
11 monthly contractor cost just for site labor alone at Vogtle could easily be at least \$40
12 million to \$50 million per month of delay. For a 39-month delay, this amounts to
13 between \$1.56 billion and \$1.95 billion of additional site labor costs to the contractor,
14 above the original EPC contract amount. In addition, the contractor has hundreds of
15 highly paid engineers working on the project in their home office. Therefore, these
16 additional labor costs are also being incurred but are not being accounted for in FPL’s
17 flawed feasibility analysis.

18
19 Another significant cost not included in the publicly reported costs for Vogtle is the
20 \$1.1 billion amount which is now the subject of litigation between the Vogtle owners
21 and the contractor. These are costs that have been claimed to have been incurred by
22 the contractor that will either be borne by the contractor or by the Vogtle owners
23 depending on the outcome of the litigation.

1 In summary, while it cannot be precisely determined, the contractor for Vogtle and
2 Summer is incurring very large costs beyond those being publicly reported by the
3 owners of the Vogtle and Summer projects. Thus, it is highly unlikely that in the next
4 round of AP 1000 construction projects, contractors will offer fixed/firm price EPC
5 contracts given the magnitude of the cost overruns for both the Vogtle and Summer
6 projects. In any case, these additional costs will certainly factor into the price of all
7 future AP 1000 construction contracts.

8
9 **Q. ARE YOU ABLE TO OPINE UPON OR DISCUSS THE MAGNITUDE OF**
10 **THESE KNOWN, BUT NOT PUBLICLY QUANTIFIED, COST OVERRUNS?**

11 A. No. The contractor's cost overruns are confidential; however, they are significant.

12
13 **Q. WHY ARE COSTS OVERRUNS OF VOGTLE AND SUMMER PROJECTS**
14 **RELEVANT TO FPL'S FEASIBILITY ANALYSIS FOR TURKEY POINT**
15 **UNITS 6 AND 7?**

16 A. The costs proposed by the contractors to design and build the Turkey Point Units 6
17 and 7 project will be informed by the total costs to design and construct the Vogtle
18 and Summer projects. The Turkey Point Unit 6 and 7 costs will include the actual
19 amounts borne by the project owners and the actual amounts incurred and borne by
20 the contractor. As a result, the capital costs to build Turkey Point Units 6 and 7 will
21 be far greater than the costs borne by the owners of Vogtle and Summer under their
22 firm/fixed price EPC contracts. Thus, FPL's actual costs will most assuredly be
23 greater than the publicly reported Vogtle and Summer owners' only costs that are

1 currently being used by FPL in its feasibility analysis for the Turkey Point Units 6
2 and 7 project.

3
4 **Q. WHAT IS THE IMPACT OF UNDERSTATING THE COST OF THE**
5 **TURKEY POINT UNITS 6 AND 7 PROJECT ON FPL'S FEASIBILITY**
6 **ANALYSIS?**

7 A. Relatively small changes in assumed capital cost can have a significant impact on the
8 results of the feasibility analysis. It is extremely important and critical to the validity
9 of the Turkey Point Units 6 and 7 feasibility analysis that the capital costs of the
10 generation options being compared are accurate and reasonably reflect the anticipated
11 cost of the units. For example, considering the 40-year operating life case shown in
12 FPL witness Brown's testimony, an increase of 7.91% in Turkey Point Units 6 and 7
13 capital costs results in no cases with feasibility.¹ For the 60-year operating life case,
14 an increase in capital costs of 36.7% results in no cases with feasibility. In these
15 analyses, Turkey Point Units 6 and 7 are considered feasible in the scenarios in which
16 the breakeven cost exceeds the HIGH end of FPL's nuclear cost range (FPL's nuclear
17 cost range is based on the non-binding cost estimate range for constructing Turkey
18 Point Units 6 and 7). The HIGH end of the non-binding cost estimate range to which
19 the breakeven cost is being compared is \$5,589/kW in 2015 dollars which is
20 contained in FPL Witness Brown's Exhibits ROB-5 and ROB-6. For example, when
21 you compare \$5,589/kW to the breakeven cost of \$5,254/kW that is also found in
22 FPL Witness Brown's ROB-5, High Fuel Cost, Env I case, this results in no

¹ The breakeven cost is the cost below which the unit is cost effective or feasible if the cost of building the unit is below that point; if the cost of building the unit is above the breakeven costs, it is no longer feasible.

1 feasibility. Tables showing the impact of increased capital costs of project feasibility
2 are presented below:

3 40-Year Operating Life

% Increase	Adjusted Cost (\$/kW)	No. of Cases with Feasibility
0%	5,589	2
5%	5,868	1
10%	6,148	0

5
6 A project cost increase of 7.91% to the HIGH end non-binding cost estimate of \$5,589/kW in
7 2015 dollars results in no feasibility when compared to the breakeven Nuclear Capital Costs
8 from FPL Witness Brown's Exhibit ROB-5.

9 60-Year Operating Life

% Increase	Adjusted Cost (\$/kW)	No. of Cases with Feasibility
0%	5,589	6
5%	5,868	5
10%	6,148	5
15%	6,427	3
20%	6,707	3
25%	6,986	2
30%	7,266	1
35%	7,545	1
40%	7,825	0

10
11
12 A project cost increase of 36.7% to the HIGH end non-binding cost estimate of \$5,589/kW in
13 2015 dollars results in no feasibility when compared to the breakeven Nuclear Capital Costs
14 from Witness Brown's Exhibit ROB-6. Thus, it is very likely the capital costs will exceed

1 the feasibility tipping point for a 40-year operating life, and more than likely for a 60-year
2 operating life.

3
4 **Q. WHAT TYPE OF ENGINEERING AND CONSTRUCTION CONTRACT IS**
5 **FPL ANTICIPATING FOR THE TURKEY POINT UNITS 6 AND 7**
6 **PROJECT?**

7 A. From FPL's responses to OPC's discovery, it appears FPL has not decided on the
8 type of contract they anticipate nor have they developed a list of firms that will be
9 contacted on this matter. In response to Interrogatory Number 6 of OPC's First Set of
10 Interrogatories, FPL states:

11 FPL has not determined the form of contract to be used for the design
12 and construction of Turkey Point Units 6 & 7.

13
14 In response to Interrogatory Number 7 of OPC's First Set of Interrogatories, FPL
15 states:

16 FPL has not developed a list of firms that will be contacted regarding
17 provision of engineering, procurement and/or construction (i.e., "EPC"
18 or "EP/C") services.
19

20 **Q. DO YOU BELIEVE THAT FPL WILL BE ABLE TO NEGOTIATE A FIRM**
21 **PRICE EPC CONTRACT SIMILAR TO THE VOGTLE AND SUMMER**
22 **CONTRACTS?**

23 A. No, I do not. Based on FPL's discovery responses, FPL has not yet developed the
24 type of contract they will use for the design and construction. In my opinion, given
25 the experience at Vogtle and Summer, it is very unlikely that any contractor will be
26 willing to agree to a firm price EPC contract similar to the Vogtle and Summer

1 contracts. Even if FPL could negotiate a firm price EPC contract, the overall contract
2 price would most certainly include the additional costs experienced in the Vogtle and
3 Summer projects.

4 **Q. SHOULD FPL'S FEASIBILITY ANALYSIS BE UPDATED TO ADDRESS**
5 **THE TRUE COSTS TO FPL RATEPAYERS?**

6 **A.** Yes, it should.

7
8 **Q. WHEN SHOULD FPL'S FEASIBILITY ANALYSIS BE UPDATED TO**
9 **ADDRESS THE TRUE COSTS TO FPL RATEPAYERS?**

10 **A.** The feasibility analysis submitted by FPL should be updated in this docket and going
11 forward to reflect the costs realistically anticipated for the Turkey Point Units 6 and 7
12 project prior to incurring costs associated with preconstruction beyond those activities
13 necessary to obtain or maintain the COL. At a minimum, the feasibility analysis
14 should be corrected by FPL to reflect the higher costs experienced in the Vogtle and
15 Summer projects including the owners' costs and an estimate of the contractor's cost
16 related to the Vogtle and Summer projects.

17
18 **Q. WHAT WILL BE A REALISTIC INDICATION OF THE TRUE COST OF**
19 **TURKEY POINT UNITS 6 AND 7 THAT SHOULD BE USED IN FPL'S**
20 **FEASIBILITY ANALYSES?**

21 **A.** I believe that the best indicator of expected true costs for the Turkey Point Units 6
22 and 7 project will be the actual, binding bids from qualified engineering, procurement
23 and/or construction (EPC or EP/C) contractors with an appropriate amount of

1 contingency added to the bids. These true costs should be incorporated both now
 2 while FPL is supporting the COL application and at the time that FPL requests
 3 approval to proceed to incur preconstruction costs after obtaining the COL. In the
 4 absence of actual, binding bids to update its feasibility analysis, FPL should include
 5 both the owners' costs and estimates for contractor's costs related to the Vogtle and
 6 Summer projects.

7
 8 **Q. PLEASE IDENTIFY THE COSTS RELATED TO TURKEY POINT UNITS 6**
 9 **AND 7 FOR WHICH FPL IS REQUESTING RECOVERY IN THIS**
 10 **PROCEEDING.**

11 A. FPL is requesting approval for recovery of the following actual/estimated costs in
 12 2015 and projected costs in 2016 as shown on FPL Witness Scroggs' Exhibit SDS-9.
 13 Although all of these costs are labeled Preconstruction Costs in Mr. Scroggs' Exhibit,
 14 the Licensing, Permitting, and Engineering & Design cost categories are related to
 15 obtaining the COL.

Category	2015 Actual/Estimated Costs (\$)	2016 Projected Costs (\$)
Licensing	15,377,764	17,047,175
Permitting	291,349	520,642
Engineering & Design	4,026,573	4,684,208
Total Preconstruction Costs Required for the COL	19,695,685	22,252,025
Initial Assessments	1,842,105	3,157,895

1 **Q. ARE THESE COSTS ALL RELATED TO OR NECESSARY FOR**
2 **OBTAINING THE COL FOR THE TURKEY POINT UNITS?**

3 A. No, they are not. In response to Interrogatory Number 4 of OPC's First Set of
4 Interrogatories, FPL states:

5 Initial Assessment analyses are required to inform the project schedule
6 and cost estimates that will be relied upon in the 2016 feasibility
7 analysis that will support FPL's anticipated request to proceed from
8 the licensing phase to the initiation of "pre-construction work," upon
9 receipt of the COL.

10

11 The Initial Assessments are not related to or required for obtaining the COL for
12 Turkey Point Units 6 and 7. In my opinion, the Initial Assessment costs as described
13 by FPL are preconstruction costs and these costs are not related to or necessary to
14 obtain or maintain the COL.

15

16 **Q. AS DESCRIBED BY FPL, ARE THE INITIAL ASSESSMENT COSTS**
17 **PRECONSTRUCTION WORK BEYOND THOSE ACTIVITIES NECESSARY**
18 **TO OBTAIN OR MAINTAIN A LICENSE?**

19 A. Yes, the Initial Assessment costs as described by FPL are preconstruction work
20 beyond those activities that are necessary to obtain or maintain a combined license
21 from the NRC for a nuclear power plant.

22

23 **Q. PLEASE PROVIDE YOUR RECOMMENDATIONS FOR THE COL.**

24 A. I recommend that only costs related to, or necessary for, obtaining the COL be
25 approved for recovery at this time. Regardless of the feasibility analysis, FPL has

1 spent a significant percent of the total cost to obtain the COL. Thus, it would be
2 unreasonable at this point for FPL not to continue the pursuit of obtaining its COL.

3
4 **Q. PLEASE GIVE YOUR RECOMMENDATIONS ON THE FLAWED**
5 **FEASIBILITY ANALYSIS.**

6 A. As I discussed earlier, FPL's feasibility analysis is flawed because the future costs of
7 the project are significantly understated. I recommend that FPL be required to correct
8 its flawed feasibility analysis during this cycle of the NCRC proceeding for the
9 Commission's consideration as appropriate.

10
11 **Q. WHAT SPECIFIC RECOMMENDATIONS TO THE FEASIBILITY**
12 **ANALYSIS WOULD YOU MAKE REGARDING FPL'S ANTICIPATED**
13 **REQUEST TO PROCEED FROM THE LICENSING PHASE TO THE**
14 **INITIATION OF PRECONSTRUCTION WORK?**

15 A. I recommend that the cost estimates that will be relied upon in the feasibility analysis,
16 that will support FPL's anticipated request to proceed from the licensing phase to the
17 initiation of preconstruction work upon receipt of the COL, be based on actual,
18 binding bids from qualified EPC or EP/C contractors with an appropriate amount of
19 contingency added to the bids. In lieu of binding bids from qualified contractors, the
20 feasibility analysis should reflect the higher costs experienced in the Vogtle and
21 Summer projects and, at a minimum, include the owners' costs and an estimate of the
22 contractor's cost related to the Vogtle and Summer projects; and FPL should submit

1 this updated analysis as a not-to-exceed cost or cap above which FPL would not seek
2 cost recovery from ratepayers for the Turkey Point Units 6 and 7 project.

3

4 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

5 **A. Yes, it does.**

6

EDUCATION: Ph.D., Nuclear Engineering, Georgia Tech 1971
MS, Nuclear Engineering, Georgia Tech 1969
BS, Mechanical Engineering, Georgia Tech 1968

ENGINEERING REGISTRATION: Registered Professional Engineer

PROFESSIONAL MEMBERSHIP: American Nuclear Society

EXPERIENCE:

Dr. Jacobs has over thirty-five years of experience in a wide range of activities in the electric power generation industry. He has extensive experience in the construction, startup and operation of nuclear power plants. While at the Institute of Nuclear Power Operation (INPO), Dr. Jacobs assisted in development of INPO's outage management evaluation group. He has provided expert testimony related to nuclear plant operation and outages in Texas, Louisiana, South Carolina, Florida, Wisconsin, Indiana, Georgia and Arizona. He currently provides nuclear plant operational monitoring services for GDS clients. Dr. Jacobs was a witness in nuclear plant certification hearings in Georgia for the Plant Vogtle 3 and 4 project on behalf of the Georgia Public Service Commission and in South Carolina for the V.C. Summer 2 and 3 projects on behalf of the South Carolina Office of Regulatory Staff. His areas of expertise include evaluation of reactor technology, EPC contracting, risk management and mitigation, project cost and schedule. He is assisting the Florida Office of Public Counsel in monitoring the development of four new nuclear units in the State of Florida, Levy County Units 1 and 2 and Turkey Point Units 6 and 7. He also evaluated extended power uprates on five nuclear units for the Florida Office of Public Counsel. He has been selected by the Georgia Public Service Commission as the Independent Construction Monitor for Georgia Power Company's new AP1000 nuclear power plants, Plant Vogtle Units 3 and 4. He has assisted the Georgia Public Service Commission staff in development of energy policy issues related to supply-side resources and in evaluation of applications for certification of power generation projects and assists the staff in monitoring the construction of these projects. He has also assisted in providing regulatory oversight related to an electric utility's evaluation of responses to an RFP for a supply-side resource and subsequent negotiations with short-listed bidders. He has provided technical litigation support and expert testimony support in several complex law suits involving power generation facilities. He monitors power plant operations for GDS clients and has provided testimony on power plant operations and decommissioning in several jurisdictions. Dr. Jacobs represents a GDS client on the management committee of a large coal-fired power plant currently under construction. Dr. Jacobs has provided testimony before the Georgia Public Service Commission, the Public Utility Commission of Texas, the North Carolina Utilities Commission, the South Carolina Public Service Commission, the Iowa State Utilities Board, the Louisiana Public Service Commission, the Florida Public Service Commission, the Indiana

Regulatory Commission, the Wisconsin Public Service Commission, the Arizona Corporation Commission and the FERC.

A list of Dr. Jacobs' testimony is available upon request.

1986-Present GDS Associates, Inc.

As Executive Consultant, Dr. Jacobs assists clients in evaluation of management and technical issues related to power plant construction, operation and design. He has evaluated and testified on combustion turbine projects in certification hearings and has assisted the Georgia PSC in monitoring the construction of the combustion turbine projects. Dr. Jacobs has evaluated nuclear plant operations and provided testimony in the areas of nuclear plant operation, construction prudence and decommissioning in nine states. He has provided litigation support in complex law suits concerning the construction of nuclear power facilities. Dr. Jacobs is the Georgia PSC's Independent Construction Monitor for the Plant Vogtle 3 and 4 nuclear project.

1985-1986 Institute of Nuclear Power Operations (INPO)

Dr. Jacobs performed evaluations of operating nuclear power plants and nuclear power plant construction projects. He developed INPO Performance Objectives and Criteria for the INPO Outage Management Department. Dr. Jacobs performed Outage Management Evaluations at the following nuclear power plants:

- Connecticut Yankee - Connecticut Yankee Atomic Power Co.
- Callaway Unit I - Union Electric Co.
- Surry Unit I - Virginia Power Co.
- Ft. Calhoun - Omaha Public Power District
- Beaver Valley Unit 1 - Duquesne Light Co.

During these outage evaluations, he provided recommendations to senior utility management on techniques to improve outage performance and outage management effectiveness.

1979-1985 Westinghouse Electric Corporation

As site manager at Philippine Nuclear Power Plant Unit No. 1, a 655 MWe PWR located in Bataan, Philippines, Dr. Jacobs was responsible for all site activities during completion phase of the project. He had overall management responsibility for startup, site engineering, and plant completion departments. He managed workforce of approximately 50 expatriates and 1700 subcontractor

personnel. Dr. Jacobs provided day-to-day direction of all site activities to ensure establishment of correct work priorities, prompt resolution of technical problems and on schedule plant completion.

Prior to being site manager, Dr. Jacobs was startup manager responsible for all startup activities including test procedure preparation, test performance and review and acceptance of test results. He established the system turnover program, resulting in a timely turnover of systems for startup testing.

As startup manager at the KRSKO Nuclear Power Plant, a 632 MWe PWR near Krsko, Yugoslavia, Dr. Jacobs' duties included development and review of startup test procedures, planning and coordination of all startup test activities, evaluation of test results and customer assistance with regulatory questions. He had overall responsibility for all startup testing from Hot Functional Testing through full power operation.

1973 - 1979 NUS Corporation

As Startup and Operations and Maintenance Advisor to Korea Electric Company during startup and commercial operation of Ko-Ri Unit 1, a 595 MWe PWR near Pusan, South Korea, Dr. Jacobs advised KECO on all phases of startup testing and plant operations and maintenance through the first year of commercial operation. He assisted in establishment of administrative procedures for plant operation.

As Shift Test Director at Crystal River Unit 3, an 825 MWe PWR, Dr. Jacobs directed and performed many systems and integrated plant tests during startup of Crystal River Unit 3. He acted as data analysis engineer and shift test director during core loading, low power physics testing and power escalation program.

As Startup engineer at Kewaunee Nuclear Power Plant and Beaver Valley, Unit 1, Dr. Jacobs developed and performed preoperational tests and surveillance test procedures.

1971 - 1973 Southern Nuclear Engineering, Inc.

Dr. Jacobs performed engineering studies including analysis of the emergency core cooling system for an early PWR, analysis of pressure drop through a redesigned reactor core support structure and developed a computer model to determine tritium build up throughout the operating life of a large PWR.

SIGNIFICANT CONSULTING ASSIGNMENTS:

Georgia Public Service Commission – Selected as the Independent Construction Monitor to assist the GPSC staff in monitoring all aspects of the design, licensing and construction of Plant Vogtle Units 3 and 4, two AP1000 nuclear power plants.

Georgia Public Service Commission – Assisted the Georgia Public Service Commission Staff and provided testimony related to the evaluation of Georgia Power Company's request for certification to construct two AP1000 nuclear power plants at the Plant Vogtle site.

South Carolina Office of Regulatory Staff – Assisted the South Carolina Office of Regulatory Staff in evaluation of South Carolina Electric and Gas' request for certification of two AP1000 nuclear power plants at the V.C. Summer site.

Florida Office of Public Counsel – Assists the Florida Office of Public Counsel in monitoring the development of four new nuclear power plants and extended power uprates on five nuclear units in Florida including providing testimony on the prudence of expenditures.

East Texas Electric Cooperative – Represented ETEC on the management committee of the Plum Point Unit 1 a 650 MW coal-fired plant under construction in Osceola, Arkansas and represents ETEC on the management committee of the Harrison County Power Project, a 525 MW combined cycle power plant located near Marshall, Texas.

Arizona Corporation Commission – Evaluated operation of the Palo Verde Nuclear Generating Station during the year 2005. Included evaluation of 11 outages and providing written and oral testimony before the Arizona Corporation Commission.

Citizens Utility Board of Wisconsin – Evaluated Spring 2005 outage at the Kewaunee Nuclear Power Plant and provided direct and surrebuttal testimony before the Wisconsin Public Service Commission.

Georgia Public Service Commission - Assisted the Georgia PSC staff in evaluation of Integrated Resource Plans presented by two investor owned utilities. Review included analysis of purchase power agreements, analysis of supply-side resource mix and review of a proposed green power program.

State of Hawaii, Department of Business, Economic Development and Tourism – Assisted the State of Hawaii in development and analysis of a Renewable Portfolio Standard to increase the amount of renewable energy resources developed to meet growing electricity demand. Presented the results of this work in testimony before the State of Hawaii, House of Representatives.

Georgia Public Service Commission - Assisted the Georgia PSC staff in providing oversight to the bid evaluation process concerning an electric utility's evaluation of responses to a Request for Proposals for supply-side resources. Projects evaluated include simple cycle combustion turbine projects, combined cycle combustion turbine projects and co-generation projects.

Millstone 3 Nuclear Plant Non-operating Owners – Evaluated the lengthy outage at Millstone 3 and provided analysis of outage schedule and cost on behalf of the non-operating owners of Millstone 3. Direct testimony provided an analysis of additional post-outage O&M costs that would result due to the outage. Rebuttal testimony dealt with analysis of the outage schedule.

H.C. Price Company – Evaluated project management of the Healy Clean Coal Project on behalf of the General Contractor, H.C. Price Company. The Healy Clean Coal Project is a 50 megawatt coal burning power plant funded in part by the DOE to demonstrate advanced clean coal technologies. This project involved analysis of the project schedule and evaluation of the impact of the owner's project management performance on costs incurred by our client.

Steel Dynamics, Inc. – Evaluated a lengthy outage at the D.C. Cook nuclear plant and presented testimony to the Indiana Utility Regulatory Commission in a fuel factor adjustment case Docket No. 38702-FAC40-S1.

Florida Office of Public Counsel - Evaluated lengthy outage at Crystal River Unit 3 Nuclear Plant. Submitted expert testimony to the Florida Public Service Commission in Docket No. 970261-EI.

United States Trade and Development Agency - Assisted the government of the Republic of Mauritius in development of a Request for Proposal for a 30 MW power plant to be built on a Build, Own, Operate (BOO) basis and assisted in evaluation of Bids.

Louisiana Public Service Commission Staff - Evaluated management and operation of the River Bend Nuclear Plant. Submitted expert testimony before the LPSC in Docket No. U-19904.

U.S. Department of Justice - Provided expert testimony concerning the in-service date of the Harris Nuclear Plant on behalf of the Department of Justice U.S. District Court.

City of Houston - Conducted evaluation of a lengthy NRC required shutdown of the South Texas Project Nuclear Generating Station.

Georgia Public Service Commission Staff - Evaluated and provided testimony on Georgia Power Company's application for certification of the Intercession City Combustion Turbine Project - Docket No. 4895-U.

Seminole Electric Cooperative, Inc. - Evaluated and provided testimony on nuclear decommissioning and fossil plant dismantlement costs - FERC Docket Nos. ER93-465-000, et al.

Georgia Public Service Commission Staff - Evaluated and prepared testimony on application for certification of the Robins Combustion Turbine Project by Georgia Power Company - Docket No. 4311-U.

North Carolina Electric Membership Corporation - Conducted a detailed evaluation of Duke Power Company's plans and cost estimate for replacement of the Catawba Unit 1 Steam Generators.

Georgia Public Service Commission Staff - Evaluated and prepared testimony on application for certification of the McIntosh Combustion Turbine Project by Georgia Power Company and Savannah Electric Power Company - Docket No. 4133-U and 4136-U.

New Jersey Rate Counsel - Review of Public Service Electric & Gas Company nuclear and fossil capital additions in PSE&G general rate case.

Corn Belt Electric Cooperative/Central Iowa Power Electric Cooperative - Directs an operational monitoring program of the Duane Arnold Energy Center (565 MWe BWR) on behalf of the non-operating owners.

Cities of Calvert and Kosse - Evaluated and submitted testimony of outages of the River Bend Nuclear Station - PUCT Docket No. 10894.

Iowa Office of Consumer Advocate - Evaluated and submitted testimony on the estimated decommissioning costs for the Cooper Nuclear Station - IUB Docket No. RPU-92-2.

Georgia Public Service Commission/Hicks, Maloof & Campbell - Prepared testimony related to Vogtle and Hatch plant decommissioning costs in 1991 Georgia Power rate case - Docket No. 4007-U.

City of El Paso - Testified before the Public Utility Commission of Texas regarding Palo Verde Unit 3 construction prudence - Docket No. 9945.

City of Houston - Testified before Texas Public Utility Commission regarding South Texas Project nuclear plant outages - Docket No. 9850.

NUCOR Steel Company - Evaluated and submitted testimony on outages of Carolina Power and Light nuclear power facilities - SCPSC Docket No. 90-4-E.

Georgia Public Service Commission/Hicks, Maloof & Campbell - Assisted Georgia Public Service Commission staff and attorneys in many aspects of Georgia Power Company's 1989 rate case including nuclear operation and maintenance costs, nuclear performance incentive plan for Georgia and provided expert testimony on construction prudence of Vogtle Unit 2 and decommissioning costs of Vogtle and Hatch nuclear units - Docket No. 3840-U.

Swidler & Berlin/Niagara Mohawk - Provided technical litigation support to Swidler & Berlin in law suit concerning construction mismanagement of the Nine Mile 2 Nuclear Plant.

Long Island Lighting Company/Shea & Gould - Assisted in preparation of expert testimony on nuclear plant construction.

North Carolina Electric Membership Corporation - Prepared testimony concerning prudence of construction of Carolina Power & Light Company's Shearon Harris Station - NCUC Docket No. E-2, Sub537.

City of Austin, Texas - Prepared estimates of the final cost and schedule of the South Texas Project in support of litigation.

Tex-La Electric Cooperative/Brazos Electric Cooperative - Participated in performance of a construction and operational monitoring program for minority owners of Comanche Peak Nuclear Station.

Tex-La Electric Cooperative/Brazos Electric Cooperative/Texas Municipal Power Authority (Attorneys - Burchette & Associates, Spiegel & McDiarmid, and Fulbright & Jaworski) - Assisted GDS personnel as consulting experts and litigation managers in all aspects of the lawsuit brought by Texas Utilities against the minority owners of Comanche Peak Nuclear Station.